

[0081] Even though the invention has been described above with reference to an example according to the accompanying drawings, it is clear that the invention is not restricted thereto but can be modified in several ways within the scope of the appended claims. Therefore, all words and expressions should be interpreted broadly and they are intended to illustrate, not to restrict, the embodiment. It will be obvious to a person skilled in the art that, as technology advances, the inventive concept can be implemented in various ways. Further, it is clear to a person skilled in the art that the described embodiments may, but are not required to, be combined with other embodiments in various ways.

1. A method, comprising:

establishing, by a first network node, a communication connection to at least one advertising device located in a geographically limited service area within which advertisements are transmitted from the at least one advertising device to at least one advertisement-receiving device through direct device-to-device, D2D, communication links;

establishing a communication connection to at least one advertisement-receiving device;

generating at least one security key for encrypting and decrypting at least part of the data which is to be transmitted in the D2D communication links, wherein each security key is valid for a predetermined validity period, and common to those at least one advertising device and at least one advertisement-receiving device within the service area which fulfill predetermined criteria, wherein the predetermined criteria requires at least one of the following: the device is within a certain service area, the device is served by a certain operator, the device is applying a certain type of service;

causing transmission of information indicating the generated at least one security key to those at least one advertising device which fulfill the predetermined criteria; and

causing transmission of information indicating at least one of the generated at least one security key to those at least one advertisement-receiving device which fulfill the predetermined criteria.

2. The method of claim 1, further comprising:

causing reception of an activation request from the at least one advertisement-receiving device, wherein the activation request is for receiving advertisements from at least one advertising device in the service area;

determining whether to accept the request or not; and

upon accepting the request, causing transmission of information to the at least one advertisement-receiving device, wherein the information indicates control information for establishing the D2D communication link with the at least one advertising device.

3. The method of claim 1, further comprising:

causing reception of an activation request from the at least one advertisement-receiving device, wherein the activation request is for receiving advertisements from at least one advertising device in the service area;

determining whether to accept the request or not;

upon accepting the request, causing transmission of information to the at least one advertisement-receiving device, wherein the information indicates control information for establishing the D2D communication link with the at least one advertising device, and

detecting the number of advertisement-receiving devices in the service area on the basis of the number of received activation requests from the advertisement-receiving devices.

4. The method of claim 1, further comprising:

configuring a certain advertisement-receiving device to report information to the network node, wherein the information relates to an advertising device being listened to or discovered by the advertisement-receiving device;

causing reception of the information from the advertisement-receiving device; and

determining whether or not the advertising device is a valid advertising device on the basis of the received information.

5. The method of claim 1, further comprising:

causing reception of information from an advertisement-receiving device, wherein the information indicates that the advertisement-receiving device is responding to a received advertisement from a specific advertising device; and

identifying the specific advertising device on the basis of the information.

6. The method of claim 1, further comprising:

causing transmission of a plurality of security keys at least to the at least one advertising device fulfilling the predetermined criteria, wherein the plurality of security keys cover a plurality of predetermined validity periods, each security key expiring after a corresponding validity period.

7. The method of claim 1, further comprising:

causing transmission of information indicating only the current security key and the security key update interval to the at least one advertisement-receiving device fulfilling the predetermined criteria.

8. The method of claim 1, further comprising:

agreeing with a second network node, which is associated with another network operator than the first network node, that the generated at least one security key is valid for each advertising device and advertisement-receiving device in the service area regardless of whether the device is served by the first or the second network node.

9. A method, comprising:

establishing, by an advertising device located in a service area, a communication connection to a network node, wherein the service area is a geographically limited area within which advertisements are transmitted from at least one advertising device to at least one advertisement-receiving device through direct device-to-device, D2D communication links;

causing a reception of at least one common security key from the network node, wherein the at least one security key is for encrypting at least part of the data which is to be transmitted through the D2D communication links, each security key is valid for a predetermined validity period, and common to those at least one advertising device and at least one advertisement-receiving device within the service area which fulfill predetermined criteria, wherein the predetermined criteria requires at least one of the following: the device is within a certain service area, the device is served by a certain operator, the device is applying a certain type of service;

encrypting data on the basis of a currently valid security key; and